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(54) Title: **PROGRAM-CONTROLLED DICING OF A SUBSTRATE USING A PULSED LASER**

(57) Abstract: A substrate (30) is diced using a program-controlled pulsed laser beam (35) apparatus having an associated memory for storing a laser cutting strategy file. The file contains selected combinations of pulse rate Δt , pulse energy density E and pulse spatial overlap to machine a single layer or different types of material in different layers (31, 32, 33, 34) of the substrate while restricting damage to the layers and maximising machining rate to produce die having predetermined die strength and yield. The file also contains data relating to the number of scans necessary using a selected combination to cut through a corresponding layer. The substrate is diced using the selected combinations. Gas handling equipment for inert or active gas may be provided for preventing or inducing chemical reactions at the substrate prior to, during or after dicing.